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Wire Rope

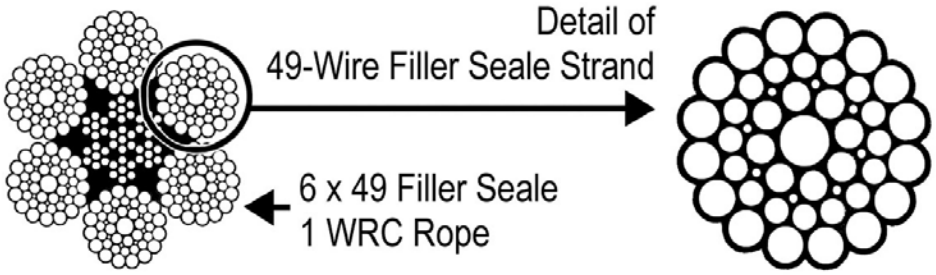
Take Care of Silo Unloader Hoist Wire Rope

Wire rope breakage during the hoisting of top silo unloaders occurs with alarming frequency. At worst, such mishaps have resulted in severe injury and death. Even where no one is injured, costly damage to equipment and time lost during a critical harvest period make the ‘dropping’ of an unloader a very expensive incident!

In some cases, wire rope failure is the result of undersized rope and/or incorrect rigging hardware being used at the time of installation. More often, breakage occurs due to misuse and/or inadequate maintenance.

Wire Rope Composition

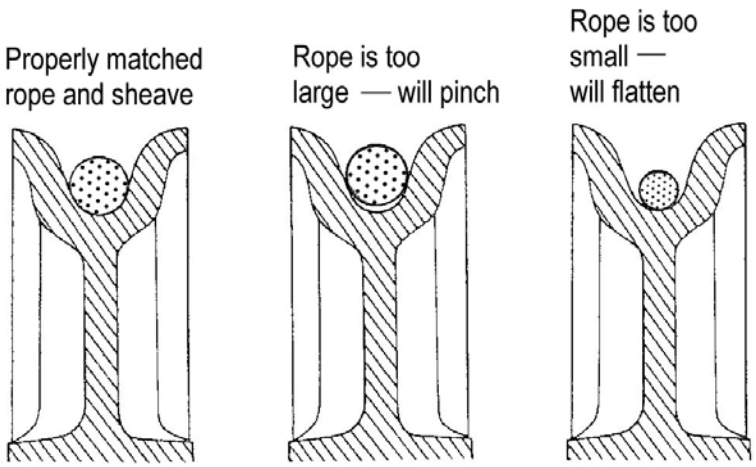
A wire rope is composed of a number of wire strands formed helically around a central axis. The axial member is known as the core, and may be made of various materials, such as fibre or steel.



Wire rope is aptly described as a precision machine. In operation, its strands change position with respect to each other. Individual wires within each strand preform in a similar manner. The relationship between these parts is carefully engineered to permit the rope to function smoothly in operation.

As with other precision equipment, internal lubrication must be provided during fabrication. This combats frictional forces (which oppose movement of parts) and prevents corrosion.

Operating factors which affect a rope in service are tension, wear, bending, crushing and corrosion. Neglect and misuse will substantially reduce a wire rope’s useful life.

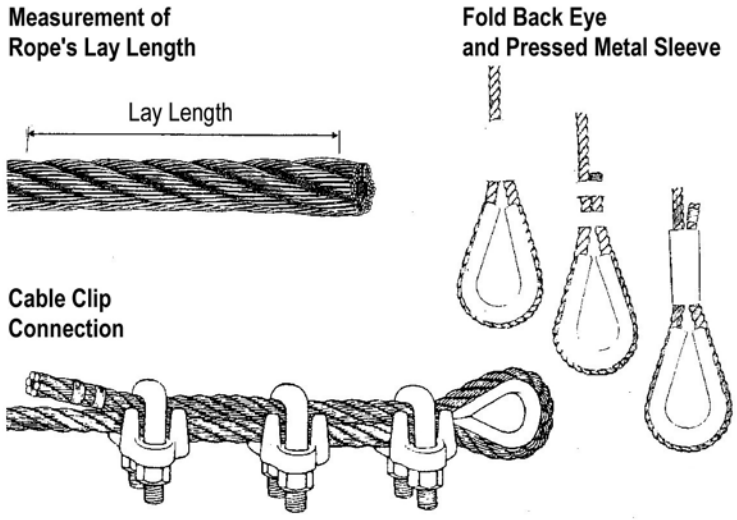


Choosing the Right Rope

Wire rope is available in a variety of grades and configurations. To the layman, the critical factors in selecting a rope are breaking strength and diameter.

An adequate factor of safety is crucial in wire rope use. For silo unloader hoist rope, the recommended safety factor is 5:1. In other words, if a silo unloader weighs one ton, the wire rope used must have a minimum ultimate breaking strength of five tons.

Rope diameter is important for compatibility with rigging hardware. In particular, the wire rope must seat properly in the sheaves (pulleys) to ensure freedom of movement without undue wear to rope or sheave.



If there is any doubt about the suitability of wire rope for a particular application, ask the contractor to provide technical specifications that will confirm an adequate safety factor. Agricultural engineers and wire rope manufacturers' representatives can inspect new or existing installations to determine whether all components meet minimum standards.

Points to Ponder

Careful installation of a new wire rope is critical. Kinking will do irreparable damage and render the kinked portion of the rope useless. Installation of wire rope should be left to someone who has thorough knowledge of safe rigging procedures.

The sheaves over which the wire rope travels must be of the exact size specified for the rope being used, and should be properly aligned. Check the condition of sheaves on a regular, scheduled basis. Sheaves that are 'frozen' due to corrosion will cause the wire rope to saw its way through.

Ensure that the rope spools properly on the winch drum. It should never be allowed to cross-wind.

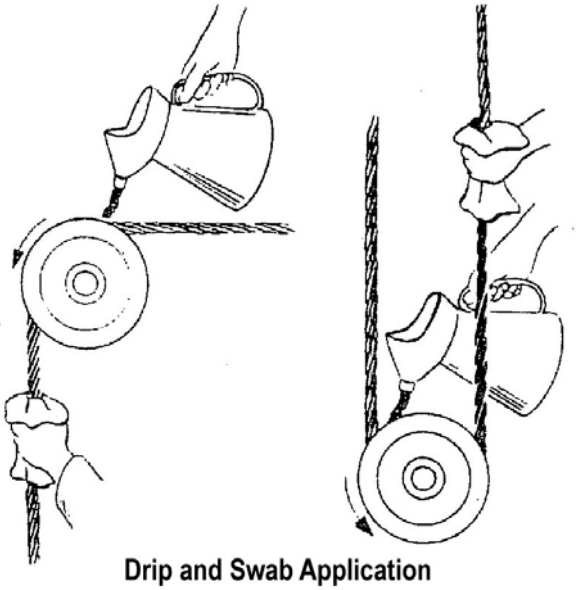
A wire rope thimble should be used in the loop eye at the end of the rope that is attached to the unloader. The thimble prevents kinking. U-bolt wire rope clips must be attached with the base of the clip bearing against the live end of the rope, while the 'U' of the bolt presses against the dead end. Clip nuts should be tightened before a rope is placed under tension, and again after the load is on the rope.

Care and Lubrication

Wire rope used to hoist silo unloaders is subject to neglect because it is normally used only once a year. Whether located inside or outside of a feed room, all silo hoist rope is exposed to corrosive conditions.

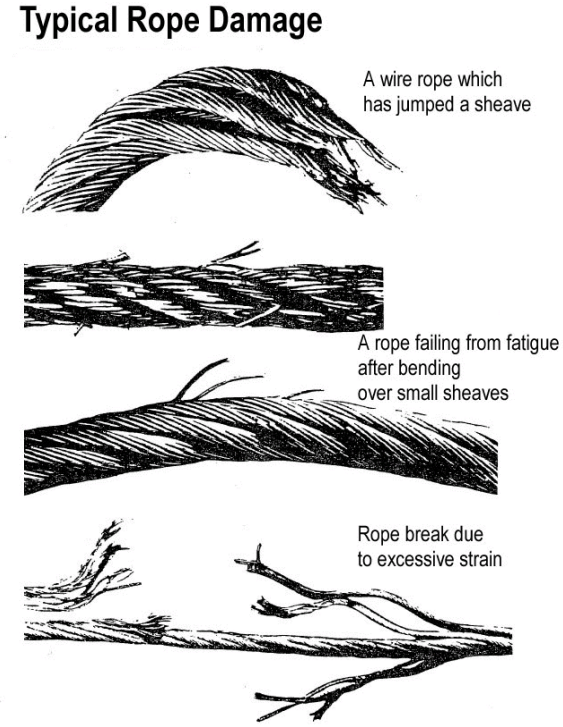
Rope condition can be checked and lubrication applied during the hoisting procedure. Watch for localized wear; premature wear at one spot is common and can be prevented if the cause is detected. Uneven wear can be minimized by moving the rope periodically so that different stretches of it are at the critical wear points. Consult a knowledgeable authority before attempting such a change.

Wire rope should bwe clean and dry before lubrication is applied. Use a wire brush or compressed air in conjunction with a recommended cleaner-solvent to remove old lubricant and debris.



Drip and Swab Application

Recommended lubricants and proper application are a must. Wire rope manufacturers can provide specific details. *Never apply used crankcase oil*; it contains small metal particles that can damage wire rope.



Hoist with Care

Hoisting of a silo unloader should always be done under careful supervision. Under no circumstances should an observer be stationed inside of the silo!

Use a recommended winch and drum. Hoist the unloader at a smooth, steady pace. The silo unloader should not be allowed tp 'bounce', as this will result in extreme stress on rope and rigging hardware. Both the wire rope and winch components can be seriously damaged if the unloader is jammed against the roof of the silo.

Summary

A 'dropped' silo is unloader is often damaged beyond repair. Such an occurrence also results in lost time and could lead to serious injury or death. Routine inspection and proper maintenance of wire rope and other hoisting components should prevent a mishap.

Farm Safety Association
Unit 22, 340 Woodlawn Road West
Huelph, Ontario (519) 823-5600